

# **WELCOME TO THE GRADER PHASE**



**Interservice**

***Training Review***

***Organization***



**y**

- Violations will terminate attendance.
- Remove all jewelry, such as rings, watches, ID tags and necklaces.
- Notify your instructor if you are taking any medication.
- Horseplay will not be tolerated. Careless acts such as throwing rocks, snowballs, or any projectiles will constitute severe academic/administrative action.

**y**

- Safety helmets, hearing protection, and seatbelts will be utilized as required.
- As an operator, when being approached by another student or instructor, you will place the directional control lever / transmission in neutral, set the parking brake, reduce the RPMs to idle and place your hands on top of your safety helmet.
- Always operate the grader in first gear.

**y**

- Never back the grader with the governor control lever engaged.
- Learn and adhere to all hand signals Wear safety goggles and gloves when checking batteries, hydraulic tank and fueling grader.
- Ground all attachments before dismounting.
- Use caution when working on hills, banks or slopes to avoid tipping.

## **Frostbite/Heat Stress:**

- Take precautions as appropriate to avoid injuries.
- Let the instructor know if you have been a casualty.
- Hydrate early in the day, regardless of the season.
- Flags

Color	Category	Work	Rest
Green -	Cat 2	50min	10min
Yellow -	Cat 3	40min	20min
Red -	Cat 4	30min	30min
Black -	Cat 5	10min	50min

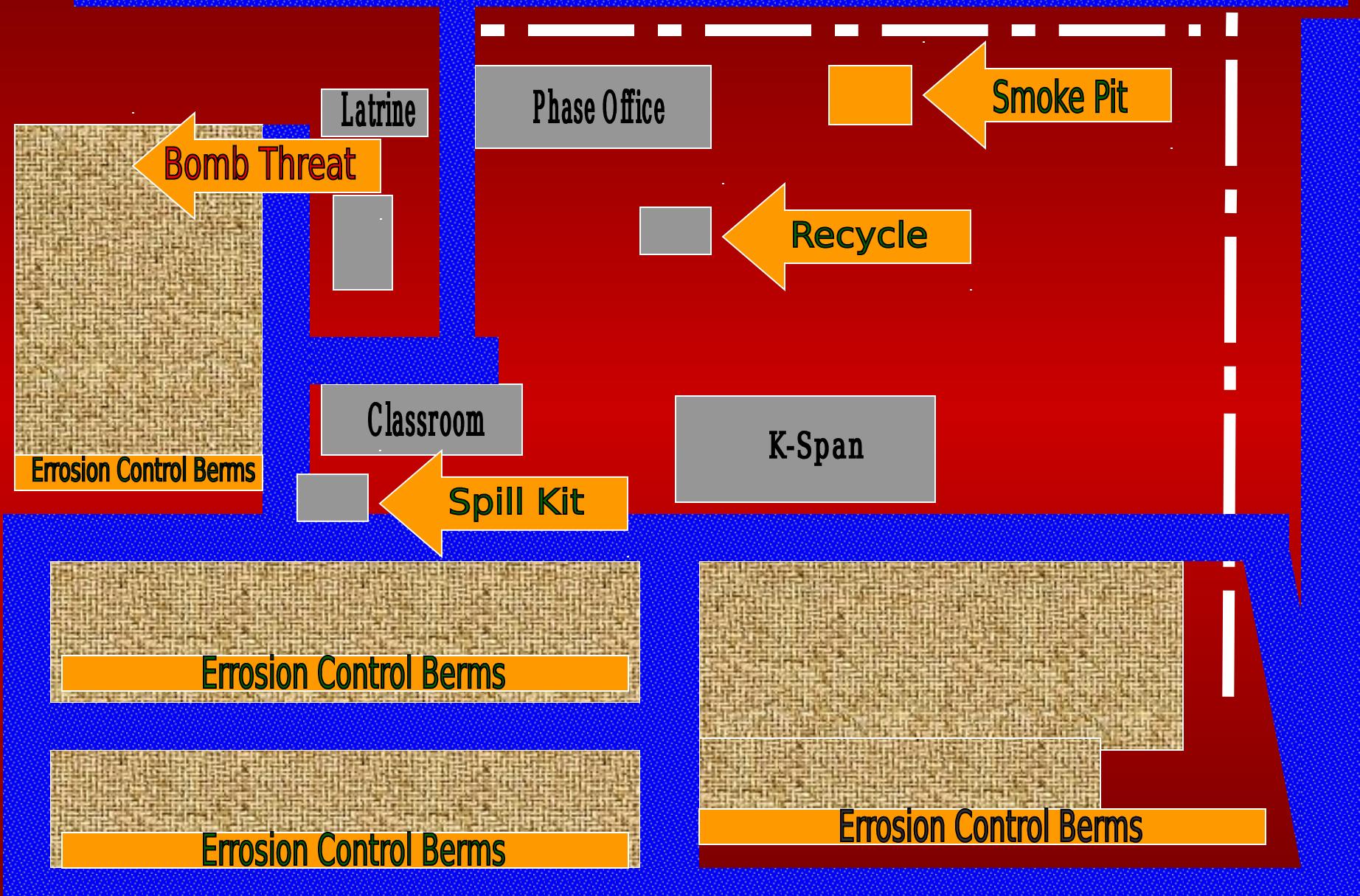
Grader Phase Introduction **Latrines / Facilities**

- The latrines will be taken care of or they will be placed off limits and port-a-potties utilized.
- Do not use tobacco products in the latrines.
- No graffiti, do not write on the walls.
- Warm-up shed.
- Tool shed.
- POL shed.
- Water faucet/boot wash.

# BREAK AREA / GUT TRUCK

- All snacks will be eaten in the break area. No snacks in the training area or class room.
- Garbage from the Gut truck will not be thrown in the latrine garbage can.
- Sunflower seeds are not authorized on the Grader Phase.
- Police up or lose you privilege

# Grader Phase Introduction



# Grader Phase Introduction **Chain of Command**

- Student class leader.
- Instructor.
- Phase chief.
- Course chief.
- Division chief.

# Critiques

- A course critique will be administered on day 8 of training.
- The purpose of the critique is to highlight deficiencies and praise accomplishments.
- If you are dissatisfied while you are at our phase, try to work it out at the lowest possible level. Use your Chain of Command

# Standards of Conduct

- Professionalism (respect for rank and each other).
- Training area and classroom:
  - Stay awake during the lectures.
  - No sleeping during breaks.
  - Raise hand to ask a question.
  - Ensure that you get your instructors permission prior to leaving classroom or training area.

# **Responsibilities of Class Leaders**

- Report to the phase office each morning with FLW Form 880.
  - Unit
  - Date
  - Class Number
  - Personnel Assigned
  - Personnel Present
  - List all personnel not present and coded
  - Ensure a point of contact is listed on the reverse side of the form.

## **\*\*NOTE\*\***

Students returning from an appointment will report to the phase office and check in.

# **Responsibilities of Class Leaders**

- **Maintain Control**
- **Maintain Uniformity**
- **Report problems (Use the Chain of Command)**
- **Class Clean-up**

# **WELCOME TO THE GRADER PHASE**



**Interservice  
Training Review**



**Organization**



## SCOPE

The purpose of this lesson is to familiarize the student with a basic understanding of the characteristics, capabilities, limitations and components of a motorized grader.

**SAFETY REQUIREMENTS:** No major considerations

**RISK ASSESSMENT:** Low

**ENVIRONMENTAL CONSIDERATIONS:** No major considerations



## NOMENCLATURE

- Grader, heavy road, motorized.

Grader Phase Introduction

# **Heavy Motorized Road Grader Caterpillar 130G**



Grader Phase Introduction

# Heavy Motorized Road Grader Champion 700 Series



Grader Phase Introduction

# **Heavy Motorized Road Grader John Deere 670**



# **Heavy Motorized Road Grader**

## **Functions and Capabilities:**

- Primary finishing equipment**
  - Ideal for finishing grade on projects
  - Precise final shaping
- Level earth already moved into position by bulldozers and scrapers**
  - Perform light stripping and leveling minor ground irregularities
  - Perform road and runway maintenance
- Mix and spread material**
  - Used to mix bituminous and other material

# Heavy Motorized Road Grader

- **Functions and Capabilities:**
  - Light scarifying
  - High bank sloping; for slopes < 3:1 use high bank slope position
  - V and flat bottom ditch
  - Snow Removal



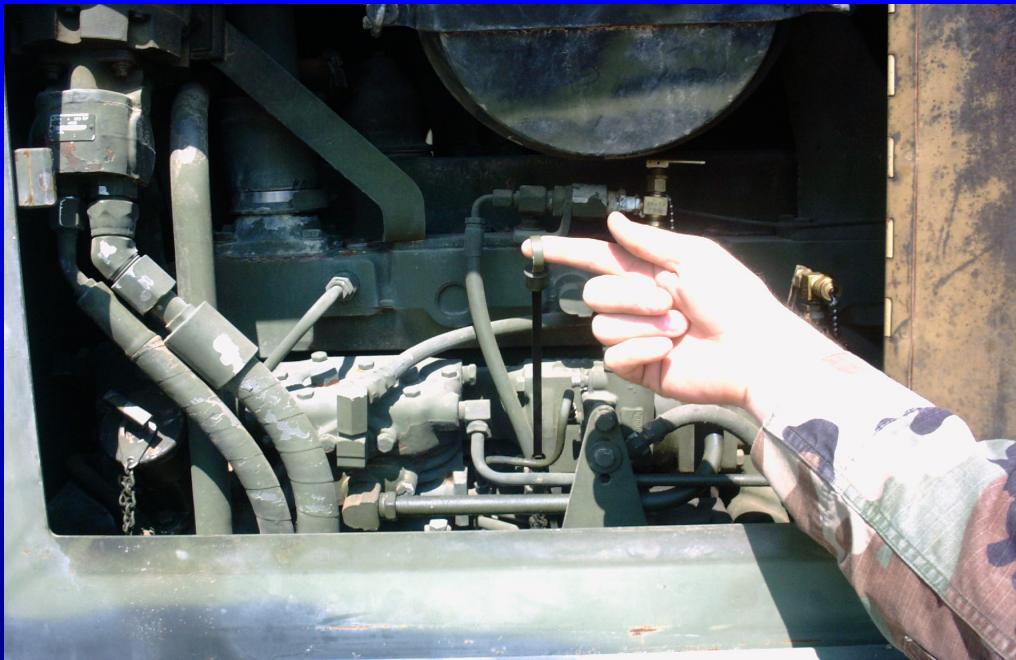
## Limitations

- **The grader itself is restricted to working on slopes no greater than 3:1**
- **In muddy conditions the grader loses traction, which causes decreased grader efficiency**
- **The grader is also restricted to making shallow cuts in medium-hard material; it should not be used for heavy excavation**

# Major Operating Components

## Diesel powered engines

- Powered by a four or six cylinder, turbo-charged, diesel engine
- Oil lubricated, proper level checked by a dipstick
- Hot and cold check on most graders
- Level “OK” between the add /full marks
- Allow engine to warm-up and cool down, 3 to 5 minutes



# Major Operating Components

## Water Cooled



# Major Operating Components

## Air Induction System



# Major Operating Components

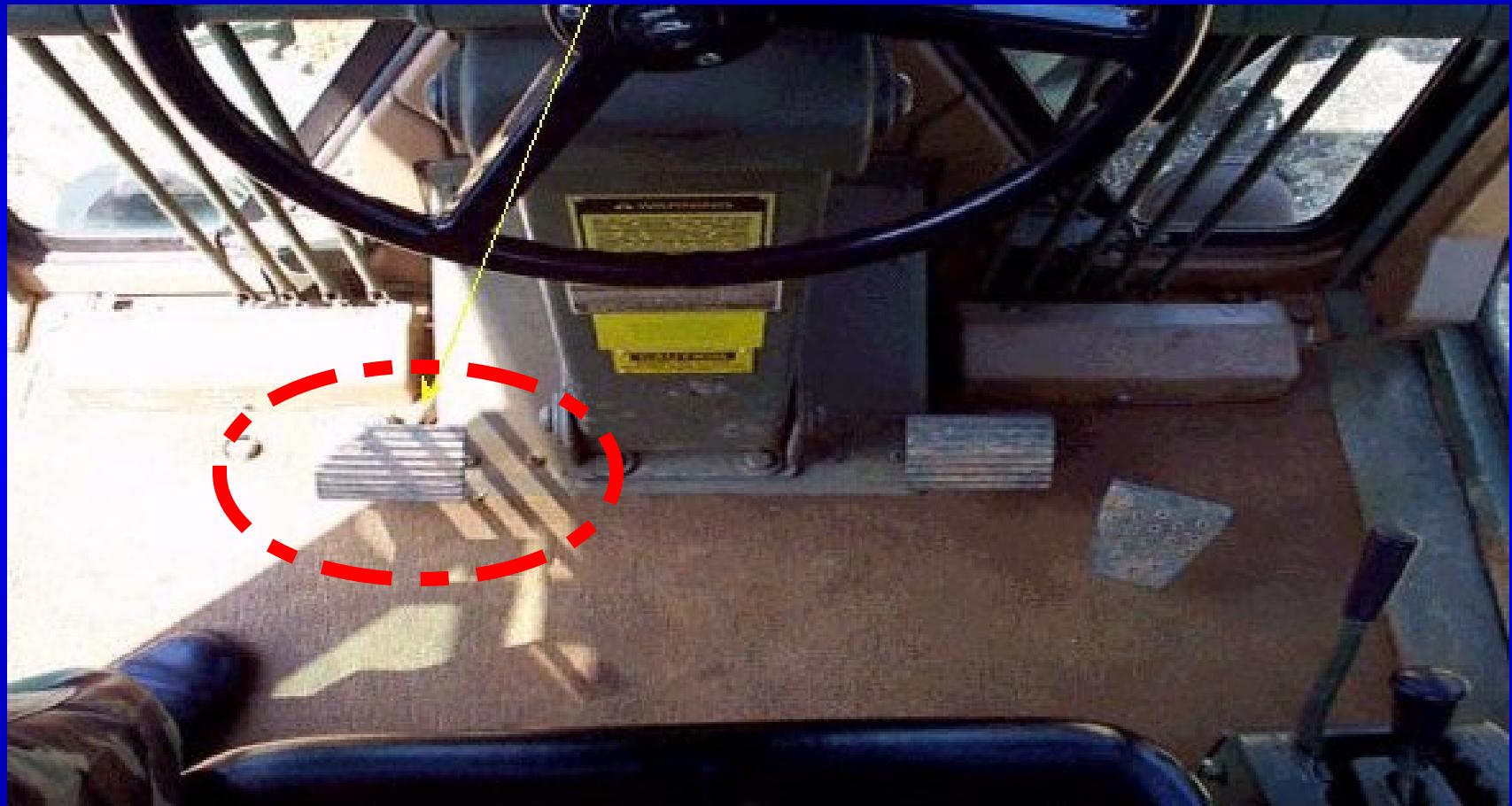
## Transmission



**Full power-shift, hydraulically powered transmission with multiple speed settings.**

# Major Operating Components

## Clutch / Inching Pedal / Modulator



Utilized to place grader in motion.

Utilized to stop grader in conjunction with the b

# Major Operating Components

## Wheels and Tires



Tire Pressure 35

PSI

V-shaped tire is self cleaning which aids  
Split-ring could cause personal injury.

# Major Operating Components

## Tandem



# Major Operating Components

## Tandem



**Locking differential restricts the turning radius.**

# **Major Operating Components**

*Review*

## **Functions**

### **Major Operating Components:**

- **Engine**
- **Transmission**
- **Clutch**
- **Wheel / Tires**
- **Tandems**

# Components

## Scarifier Log



Capable of light scarifying with a front mounted V-tine scarifier log

# Component

## Scarifier Log



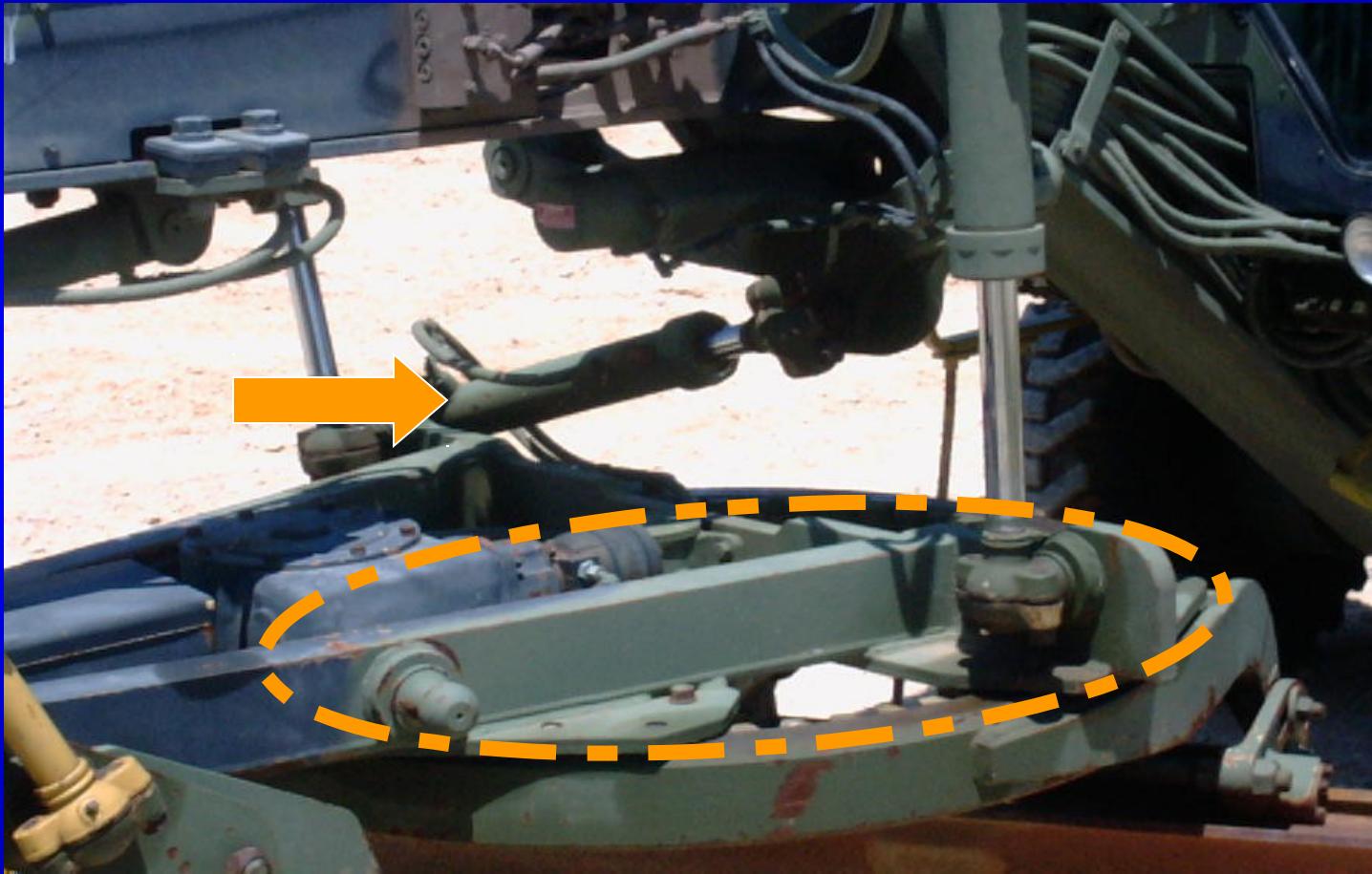
**maximum number of teeth are used for moderate to hard**  
**Minimum number of teeth are used for hard to ve**

# Components

## Mold Board



# Components



A table-top apparatus to which the moldboard is attached.  
The Center Shift Cylinder moves the circle left and right.

# Components

## Blade Pitch



All the way FORWARD for a mixing action.

# Components

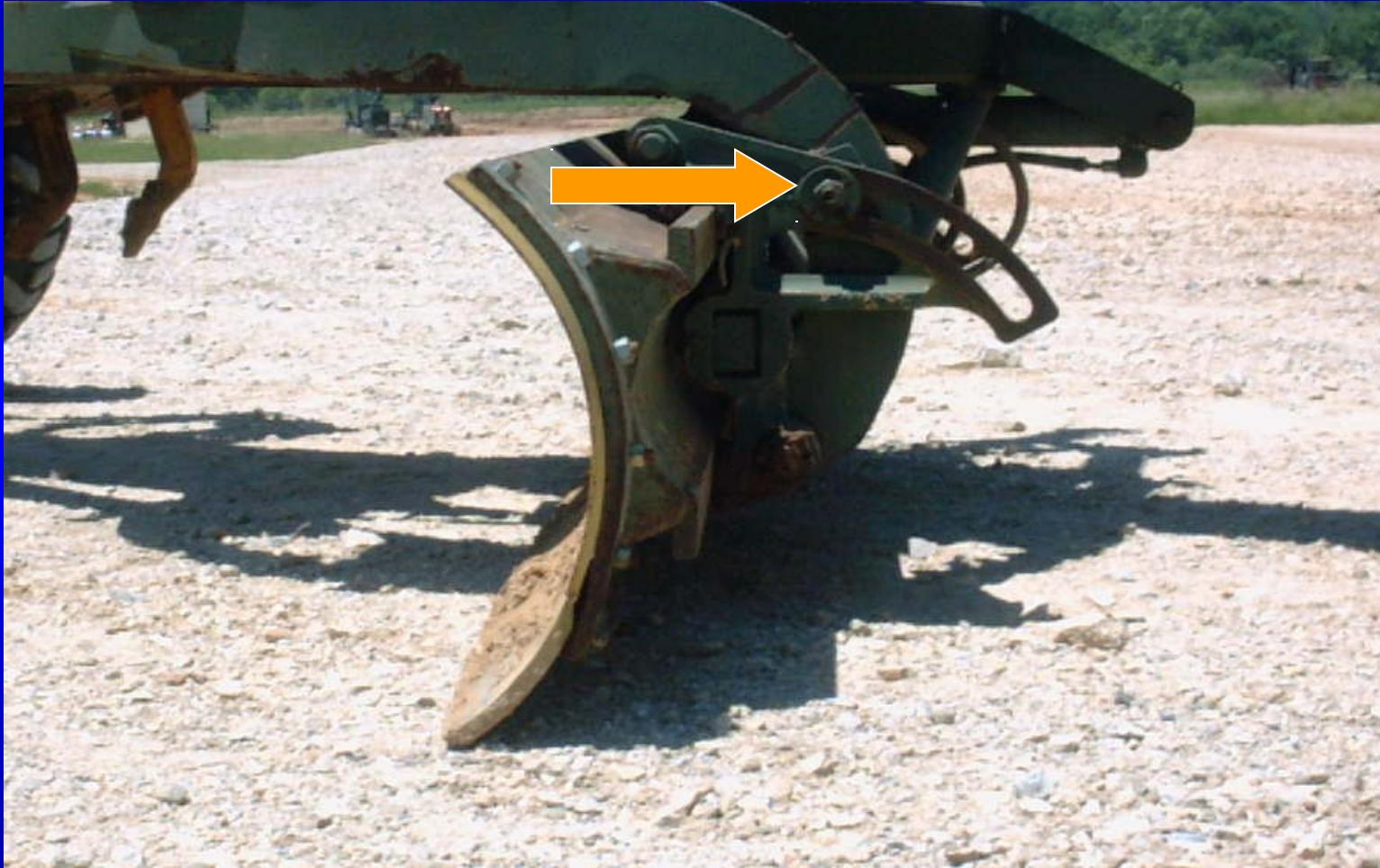
## Blade Pitch



HALF WAY for general grading action.

# Components

## Blade Pitch



All the way BACK for a cutting action.

# Components

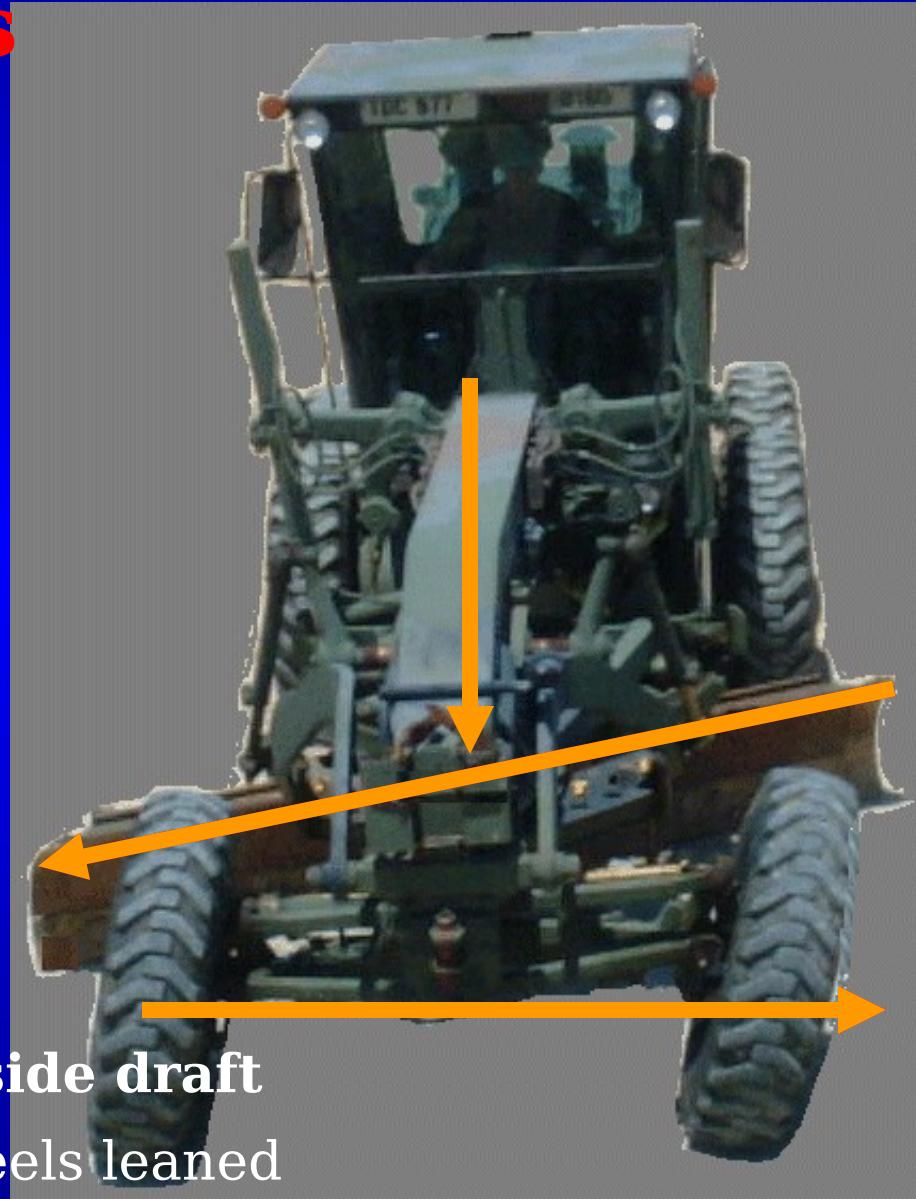
## Blade Side Shift



A cylinder positioned parallel, attached to the back of the moldboard slides the moldboard left or right providing greater maneuverability.

# Components

## Wheel Lean



**Wheel lean is used to minimize side draft**  
Never back the grader with the wheels leaned

# Components

## Steering



Straight Framed

# Components

## Steering



Articulated

# Components

## Steering



Crab Mode

# Components Review

- Scarifier Log
- Moldboard
- Circle / Center Shift
- Blade Pitch
- Blade Side Shift
- Wheel Lean
- Steering Modes

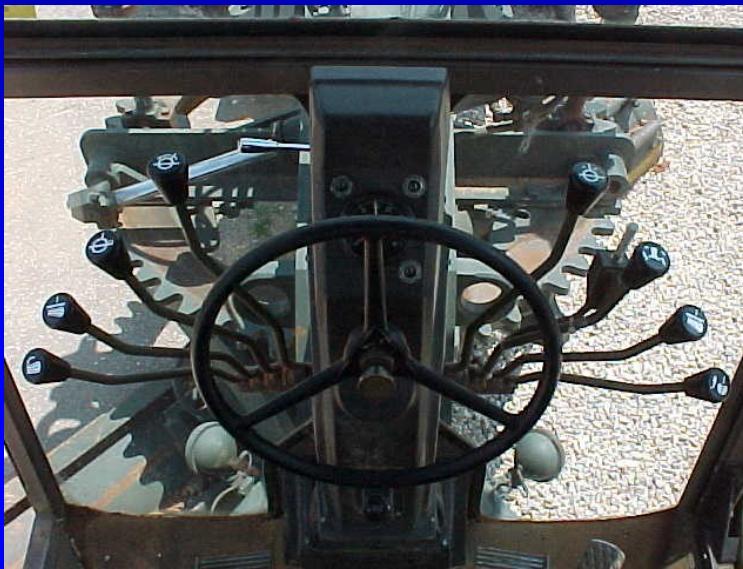
# Controls

## Champion

Caterpillar

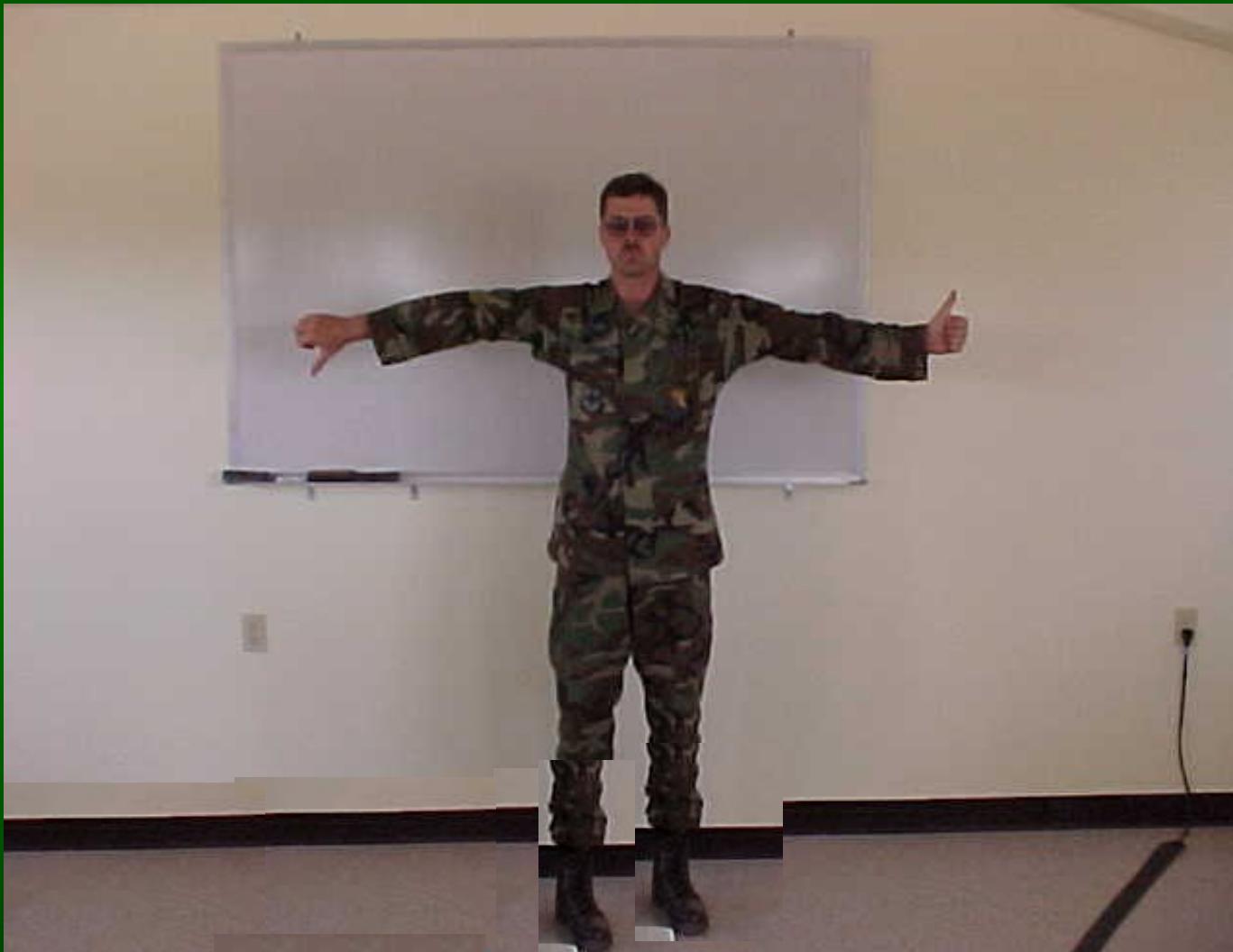


John  
Deere



Grader Phase Introduction

# Hand Signals Coordinated Blade End Movement



# Hand Signals

Raise and Lower End of Blade



# Hand Signals Circle Blade



Grader Phase Introduction

# Hand Signals

## Blade Side Shift / Slide Blade



# Hand Signals **Scarifier UP and Down**



Grader Phase Introduction

# Hand Signals Center Shift



Grader Phase Introduction

# Hand Signals **Wheel Lean**



Grader Phase Introduction

# Hand Signals Carry Position



Grader Phase Introduction

# Hand Signals **Parkline Position**



# Hand Signals

## Blade Pitch Up and Down



Grader Phase Introduction

# Hand Signals **Straighten Heel Cylinder**



# General Rules of Operation

- **Safety equipment (Hard hats, hearing protection)**
- **Watches, rings, jewelry**
- **Safety position**
- **Grade / Scarify in forward motion only (1st gear)**
- **Hand Throttle (only while blade is on ground)**
- **Backing (use foot throttle)**
- **Differential Lock**
- **360 Walk Around**

## REVIEW

- **Controls**
- **Hand signals**
- **General rules of operation**

# Summar y

QUESTIONS

